Effects of Tobacco Components on *Streptococcus mutans* and the Role of *S. mutans* in Apoptotic Cell Death through Macrophage Interactions

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Cigarettes have thousands of components aside from tobacco and nicotine that are harmful to the smoker's body. Smoking is considered a significant risk factor for cardiovascular disease (CVD) and periodontal disease. One of the aims of this study is to determine the effect of different tobacco components on the growth of *S. mutans*. *S. mutans* is an oral bacteria found in most humans that is considered to be the causative agent for dental caries. *S. mutans* can potentially lead to the inflammation of the heart and arteries which can turn to atherosclerosis.

Atherosclerosis is a complex inflammatory disease and is the leading cause of death in the United States. Inflammation is the main concern as it has a key role in the development of atherosclerosis. Irritation can be caused by the relationship of bacteria like *S. mutans* with macrophages and other white blood cells defending against foreign pathogens. The main focus of the research in this specific project is to establish how macrophage interactions with *S. mutans* are causing apoptosis in the endothelial cells lining the arteries and veins. Apoptosis is programmed, energy-dependent cell death that causes cells to shrink with no loss of the membrane integrity.

The long term goal of this study is to determine if smokers are at higher risk of being diagnosed with atherosclerosis in correlation to *S. mutans* and tobacco components. Apoptosis is studied by the determination of apoptotic mediator levels. Apoptotic mediators allow for the measurement of cell death. This allows for the configuration of the data presented.

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